

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

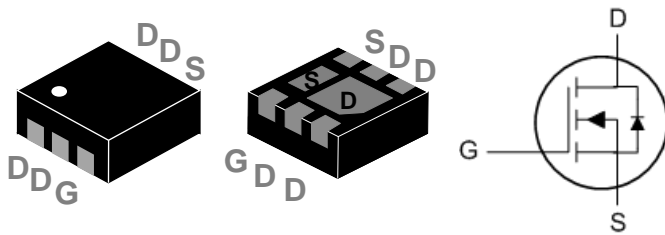
BVDSS	RDSON	ID
20V	15mΩ	8.5 A

### Features

*20V, 8.5A, RDS(ON) = 15mΩ @ VGS = 4.5V*

- Improved dv/dt capability
- Fast switching
- Green Device Available
- Suit for -1.8V Gate Drive Applications

### DFN2x2-6L Pin Configuration



### Applications

- Notebook
- Load Switch
- Battery Protection
- Hand-held Instruments

### Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Drain Current – Continuous ( $T_c=25^\circ\text{C}$ ) (Chip Limitation)	8.5	A
	Drain Current – Continuous ( $T_c=100^\circ\text{C}$ ) (Chip Limitation)	6.9	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup> (Chip Limitation)	34	A
$P_D$	Power Dissipation ( $T_c=25^\circ\text{C}$ )	2.08	W
	Power Dissipation – Derate above $25^\circ\text{C}$	0.016	W/ $^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ\text{C}/\text{W}$

Electrical Characteristics ( $T_J=25\text{ }^\circ\text{C}$ , unless otherwise noted)

## Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	$BV_{DSS}$ Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=1\text{mA}$	---	0.02	---	$V/^\circ\text{C}$
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu\text{A}$
		$V_{DS}=16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	10	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	$\pm 10$	$\mu\text{A}$

## On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=5A$	---	13	15	$\text{m}\Omega$
		$V_{GS}=2.5V, I_D=3A$	---	20	23	$\text{m}\Omega$
		$V_{GS}=1.8V, I_D=2A$	---	29	37	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.6	1	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2	---	$\text{mV}/^\circ\text{C}$
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_S=5A$	---	12	---	S

## Dynamic and switching Characteristics

$Q_g$	Total Gate Charge <sup>2,3</sup>	$V_{DS}=10V, V_{GS}=4.5V, I_D=5A$	---	16.9	26	nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	1.1	3	
$Q_{gd}$	Gate-Drain Charge <sup>2,3</sup>		---	4	7	
$T_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DD}=10V, V_{GS}=4.5V, R_G=25\Omega$ $I_D=1A$	---	6.8	13	ns
$T_r$	Rise Time <sup>2,3</sup>		---	20	38	
$T_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	41.8	79	
$T_f$	Fall Time <sup>2,3</sup>		---	13.2	25	
$C_{iss}$	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, F=1\text{MHz}$	---	1020	1480	pF
$C_{oss}$	Output Capacitance		---	160	240	
$C_{rss}$	Reverse Transfer Capacitance		---	110	160	
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	2	4	$\Omega$

## Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	8.5	A
$I_{SM}$	Pulsed Source Current		---	---	16	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V

## Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu\text{s}$  , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

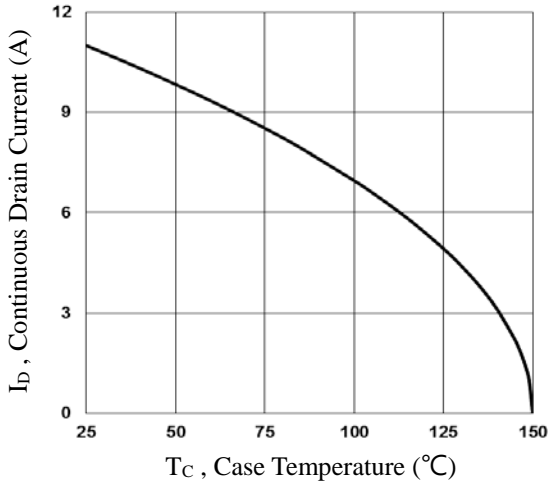


Fig.1 Continuous Drain Current vs.  $T_c$

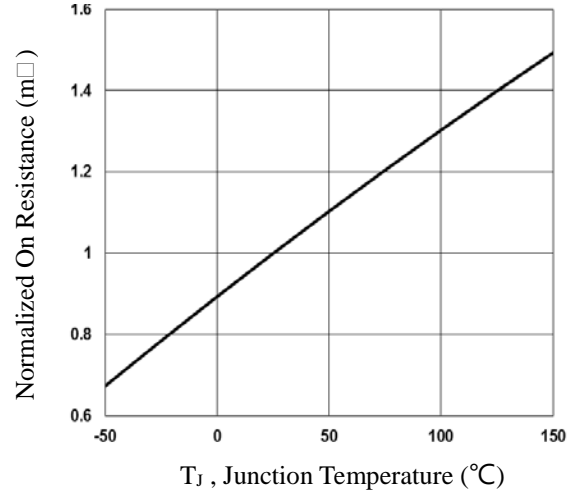


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$

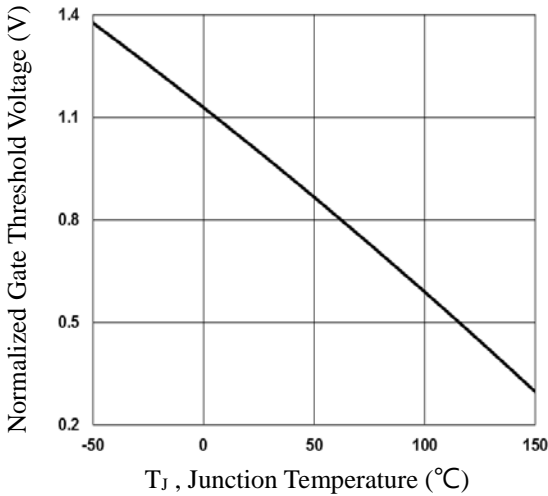


Fig.3 Normalized  $V_{th}$  vs.  $T_j$

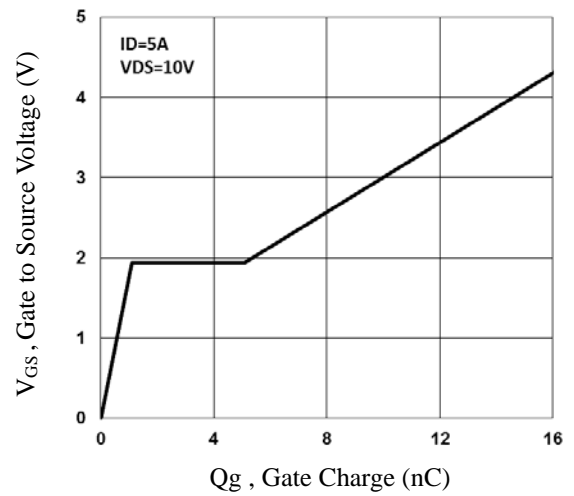


Fig.4 Gate Charge Waveform

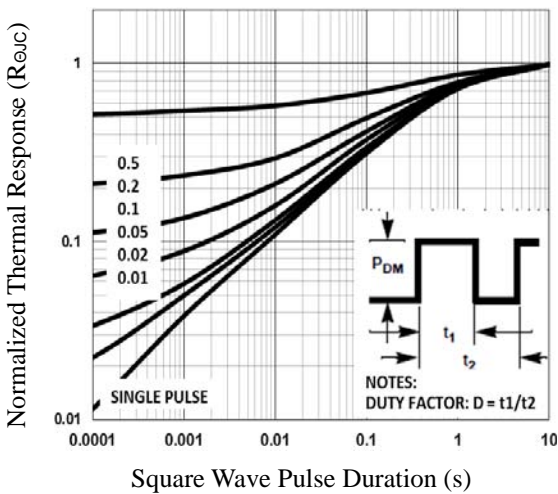


Fig.5 Normalized Transient Response

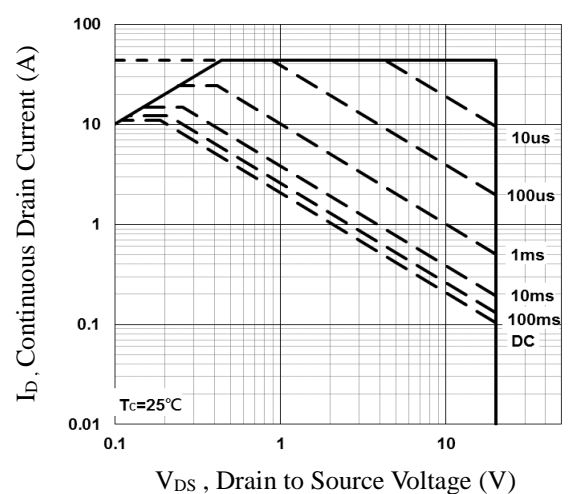
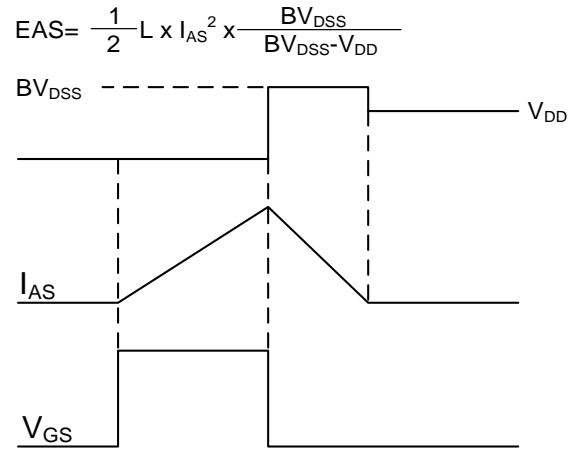
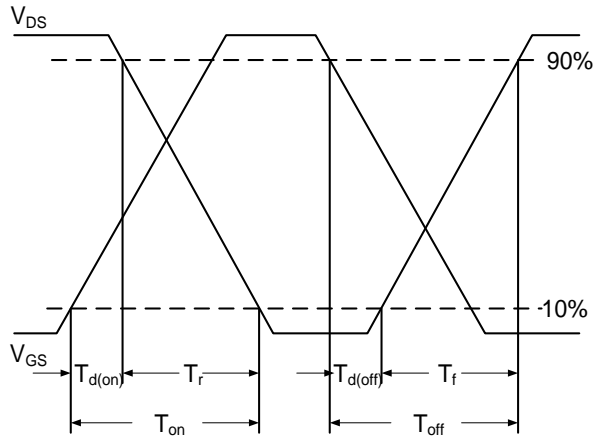


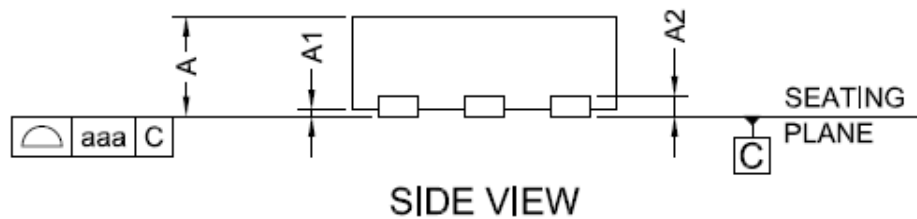
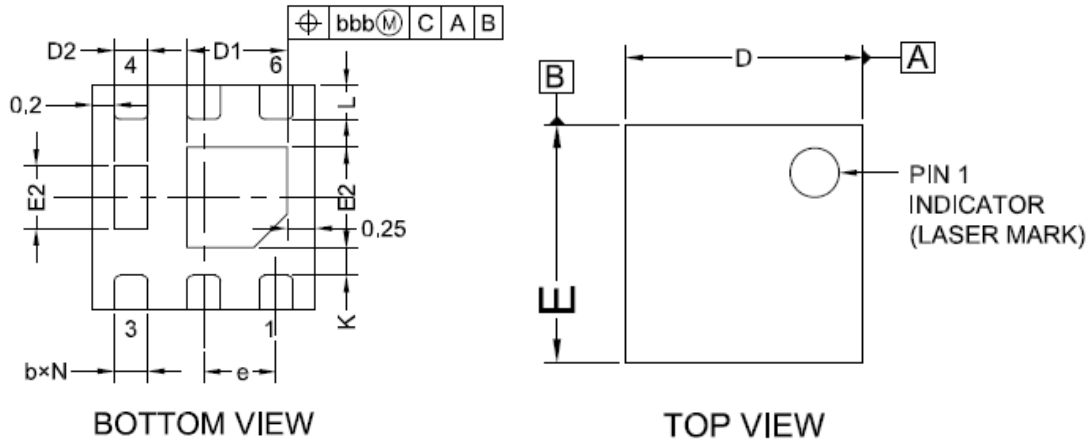
Fig.6 Maximum Safe Operation Area



# FTK2014DFN22



## DFN2X2 6L PACKAGE INFORMATION



COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
A2	0.152REF.		
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D1	0.80	0.90	1.00
D2	0.25	0.30	0.35
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
E2	0.46	0.56	0.66
e	0.65BSC		
L	0.25	0.30	0.35
J	0.40BSC		
K	0.20MIN		
N	6		
aaa	0.08		
bbb	0.10		